

Date: Monday, 6/2/2008 8:53:14 AM  
User: Chantal Lavoie

# Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: ROUND BILLET 17-4
Job Number	: 39627		
Estimate Number	: 10041		
P.O. Number	:	Part Number	: D6104007
This Issue	: 6/2/2008	S.O. No.	:
Prsht Rev.	: NC	Drawing Number	: D6104 REV B
First Issue	: / /	Project Number	: N/A
Previous Run	: 38689	Drawing Revision	: B
	Type : PURCHASED PARTS	Material	:
Written By	:	Due Date	: 6/12/2008
Checked & Approved By	: <u>JUD 08.08.02</u>	Qty:	20 Um: Each
Comment	: Est. A: 01.05.08 New Issue EC		

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	PG	PURCHASING
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### Comment: PURCHASING

Issue P/O: 6522

a) Description: S.S round billet

b) Ø4.50" x 5.10" long

c) Tolerance on all dimensions are +0.030"/-0.000"

d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630)

e) One blank makes 2 parts

f) Material certification required

C208/06/06 (20)

2.0	D6104007P	17-4 SS Roundbar 4.50"OD
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 20.0000 Each(s)  
17-4 SS Roundbar 4.50"OD

3.0	PACKAGING 1	PACKAGING RESOURCE #1
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### Comment: PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure material certification is attached

Pd/17 (20)  
DIMENSIONAL CHECK

4.0	QC6	
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### Comment: DIMENSIONAL CHECK

Ensure Material certification comply to Dwg D6104

Jud 08.07.29

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 6/2/2008 8:53:14 AM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: ROUND BILLET 17-4

Job Number: 39627

Part Number: D6104007

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location:

30 Machining

MF 08-07-29

6.0

QC21

FINAL INSPECTION/W/O RELEASE



08/07/30

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



MF 08-07-29

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

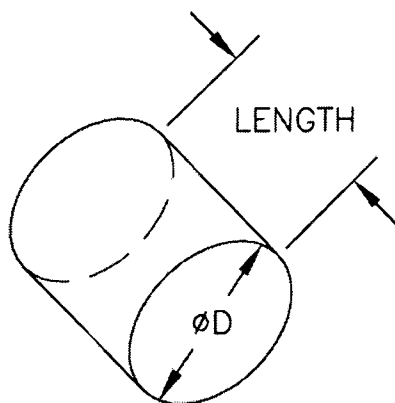


DESIGN E.F.	DRAWN BY 	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED 	APPROVED 	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29

## SPECIFICATION CONTROL DRAWING



W/O 39627

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRc)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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Ship From: THYSSENKRUPP MATERIALS NA  
2821 LANGSTAFF ROAD  
CONCORD, ONTARIO L4K 5C6  
Tel: 905 669 9444 Fax: 9057389033

L A D I N G

No: PEC 549800  
Ship Date 16Jun08 at 8:45 From PF  
Probill T145879  
Via APEX FORWARDING  
FOB CONCORD  
Frt PREPAID  
Route 0- 0 Manifest  
Vhcle Trailer  
Slp MARIO CARREIRO  
Sold To: ( 20115)  
DART AEROSPACE  
1270 ABERDEEN ST  
HAWKESBURY, ON K6A 1K7

Ship To: ( 1)  
DART AEROSPACE  
1270 ABERDEEN ST  
HAWKESBURY, ON K6A 1K7  
Tel: 613-362-9577 Fax: 613-632-1053

B I L L O F L A D I N G

1) Our Order PEC-986183- 1 Your PO # PO00006522  
Part # Rel # CHANTAL  
STAINLESS STEEL ROUND BAR 17-4 STAINLESS  
4.50" DIA X 5.1000"  
\* ALLOW 3-4 DAYS FROM THE U.S \* OUTOKUMPU DOMESTIC  
MATERIAL \*

Heat Number  
517941

Tag No  
9066

Quantity  
8 ' 6.0000 "

PCS  
20

Wt LBS  
467

TOTAL: Tags 1

PCS  
20

LBS  
467

MILL TEST REPORTS, PACKING SLIPS ARE TO SENT  
WITH MATERIAL AND FAXED TO THE CUSTOMER PRIOR  
TO SHIPPING.

ATTN: CHANTAL/LINDA

\*\* ALL PACKING SLIPS MUST HAVE THE HEAT NUMBER \*\*

\*\* REFERENCED ON IT \*\*

TOTAL 1 BOX 520 LBS

\*CUSTOMER PICK-UP HRS AT THYSSENKRUPP MATERIALS NA  
CONCORD, ONT.\* \*\*\* 9:00 AM TO 4:00 PM \*\*\*

\*\*\*\*\*

\* WE STOCK STAINLESS STEEL \*

\* PLEASE LET US QUOTE YOUR NEXT REQUIREMENT \*

\*\*\*\*\*

Page: 1 .... Last

TOUTES ERREURS ENCOU MARCHANDISES...

RETOUR DE MARCHANDISES...

RETOUR DE MARCHANDISES...

# COPPER AND BRASS SALES

## MATERIAL TYPE STAINLESS STEEL

AISI SERIES  
200 300 400  
AND  
PRECIPIT HARDENING GRADES

## "WARNING"

INHALATION OF FUMES, FRESHLY GENERATED BY THE WELDING OF STAINLESS STEEL CONTAINING ONE OR MORE OF THE FOLLOWING INGREDIENTS, ZINC, MAGNESIUM OR COPPER, ARE KNOWN TO CAUSE METAL FUME FEVER. INHALATION OF DUST OR FUME FROM STAINLESS STEEL CONTAINING ONE OR MORE OF THE FOLLOWING INGREDIENTS, ALUMINUM, IRON, MANGANESE, SELENIUM, OR TIN, HAS ALSO BEEN REPORTED TO CAUSE METAL FUME FEVER AND MAY CAUSE IRRITATION TO THE RESPIRATORY TRACT AND/OR AGGRAVATE PRE-EXISTING CONDITIONS. TARGET ORGAN IS PRIMARILY THE LUNG.

THIS PRODUCT CONTAINS CHROMIUM. EXPOSURE TO CHROMIUM DUST OR FUME MAY CAUSE METAL FUME FEVER WITH FLU-LIKE SYMPTOMS AND KIDNEY AND LIVER DAMAGE. UNDER HIGH TEMPERATURES, HEXAVALENT CHROMIUM MAY BE PRODUCED, IF IN THE INSOLUBLE FORM, IT IS A CONFIRMED HUMAN CARCINOGEN. THIS PRODUCT MAY ALSO CONTAIN NICKEL AND COBALT. INHALATION OF NICKEL OR COBALT DUST OR FUME MAY RESULT IN INFLAMMATION OF THE RESPIRATORY TRACT. NICKEL AND COBALT HAVE BEEN IDENTIFIED AS POTENTIAL HUMAN CARCINOGENS.

IF COATED WITH OIL, MAY CAUSE SKIN IRRITATION/DERMATITIS BY CONTACT. WELDING FUME IS LISTED AS A POSSIBLE CARCINOGENIC TO HUMANS.

READ THE STAINLESS STEEL MATERIAL SAFETY DATA SHEET (MSDS) ON FILE WITH YOUR EMPLOYER BEFORE WORKING WITH THIS MATERIAL

- \* If processing or recycling produces particulate, use exhaust ventilation or other controls designed to prevent exposure to workers. Examples of such activities include melting, welding, grinding, abrasive sawing, sanding and polishing. Any activity which abrades the surface of this material can generate airborne particulate. Use respiratory protection (P100, quantitative fit testing required) if exposures exceed the permissible limits.
- \* The Occupational Safety and Health Administration (OSHA) have set mandatory limits on occupational exposures.
- \* Stainless Steel, in solid form and as contained in finished products presents no special health risk.
- \* Sold for manufacturing purposes only. This product can be recycled; contact your sales representative.

The Occupational Safety and Health Administration require employers to provide training in the proper use of this product.

For additional information, call or write to Copper and Brass Sales, 22355 West Eleven Mile Road, Southfield, MI 48033, telephone 248-233-5600, or visit our web site @ [www.copperandbrass.com](http://www.copperandbrass.com).



## Certificate of Test

\*\*\*\*\*  
\* CERTIFICATION \*  
\*\*\*\*\*

HEAT 517941 ORDER 0502169/001 SON 33595D BOL 0149438 TAG 1929158 05/14/08

SHIP TO:  
COPPER & BRASS SALES  
6555 EAST DAVISON

DETROIT MI 48212

----- YOUR ORDER & DATE -----  
CY3921 5/14/08 CUST# COPBRA01 CUST TAG#408866-2

----- ITEM DESCRIPTION -----  
GRADE 17-4  
Size 17-4 HRART RND BAR 4-1/2 STD Country of Melt: SWE  
Ship Condition A Country of Mfg.: USA  
NAFTA Country of Origin is Country of Melt

Total Bundles 2 SON Weight 4085

----- SPECIFICATIONS -----  
MPG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED FROM SWEDEN  
AMS 2303E AMS 5643R  
ASME SA564 E04 A06 ASTM A484 06B  
ASTM A564 04 TYPE 630 DIN 50049/EN 10204-3.1B  
AISI 630, UNS S17400 DFARS 252.225.7014 6/05  
NO WELD REPAIR FREE OF MERCURY CONTAMINATION

----- MECHANICAL & OTHER TESTS -----  
Test Condition H900  
Hardness as shipped 286 HBW Hardness as tested 409 HBW  
Hardness as shipped ( 30 HRC ) Hardness as tested ( 44 HRC )  
Grain size 9.0 Tensile strength, KSI (MPa) 198.0 (1365)  
Micro OK 0.2% Yield Strength, KSI (MPa) 178.0 (1227)  
Intergranular corrosion OK  
Macro OK  
Elongation % in 4D 15.0  
Reduction of area % 51.0  
Ferrite .0  
Hardenability 44 HRC

----- CHEMICAL COMPOSITION -----  
Carbon (C) .014 Manganese (Mn) .910  
Phosphorus (P) .021 Sulphur (S) .024  
Silicon (Si) .400 Chromium (Cr) 15.670  
Nickel (Ni) 4.800 Cobalt (Co) .110  
Copper (Cu) 3.250 Moly (Mo) .180  
Nitrogen (N) .021 Columbium (Cb) .280  
Titanium (Ti) .005 Aluminum (Al) .003  
Tin (Sn) .005 Cerium (Ce) .010  
Boron (B) .001 Tantalum (Ta) .005  
Vanadium (V) .036  
Columbium/ Tantalum (Cb+Ta) .285  
Iron (Fe) Balance  
Frequency .000 Severity .000  
Melt Practice EAF  
Refining Practice AOD  
De-long Ferrite

Knowingly & willfully falsifying or concealing a material act on this form,  
or making false, fictitious or fraudulent statements or representations  
herein could constitute a felony punishable under federal statutes.

We hereby certify that the test results shown in this report are correct and  
accurate as contained in the records of the company and are in compliance  
with the specifications, codes, and standards listed above.

M.F. Marcanio, Quality Manager

*M.F. Marcanio*